Inventions & Innovation Project Abstract

New Regenerative Cycle for Vapor Compression Refrigeration

With this project, Magnetic Development, Inc. aspires to achieve higher efficiency and COP (Coefficient of Performance) for new regenerative thermodynamic cycle as comparing to existing technology.

The project involves the development of a novel vapor compression cycle with regenerative use of the potential energy of two-phase flow expansion, which in traditional systems is lost in throttle (expansion) valves. The potential energy of throttling is used for compression cycles. The novelty of the cycle is in the equipment and in the way the multi-staging is accomplished. The application result will be a new refrigeration system that requires less energy to accomplish a cooling task. The application of this technology will be for more efficient designs of: 1. Industrial chillers, 2. Refrigeration plants, 3. Heat pumps, 4. Gas Liquefaction plants, 5. Cryogenic systems.

This technology will provide considerable societal benefits by improving energy efficiency, bringing clean, reliable and more affordable heating and cooling to the residential and commercial buildings and reducing greenhouse gases emission. It can provide the same amount of heating and cooling considerably less use of electrical energy thud reducing national dependence on foreign oil. In addition, the proposed technology will reduce the cost if energy to homeowners and apartment dwellers and utilize the renewable energy sources. The more efficient geothermal heat pumps will increase the efficiency of buildings while applications of the new cycle to refrigerators and air-conditioners will improve the efficiency of appliances.

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